Supporting play with digital media: Informal learning in the Fifth Dimension

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This paper describes a project established in an out-of-school environment to study children using digital media, incorporating computers and peripheral equipment such as digital cameras, in fun and informal ways. In this setting the students are supported to create their own digital media resources such as movies, web pages and animations. The project is an iteration of "The Fifth Dimension" - a world-wide network of similar sites in USA, Brazil, Mexico, Scandinavia and also in Barcelona, Spain. The Fifth Dimension (5D) sites operate as diverse educational settings where researchers, teachers, students/pre-service teachers and children collaborate to create and sustain their community and activities. The concept of the Fifth Dimension evolved from research [1] dedicated to developing inclusive learning contexts where children who may not be successful in traditional classrooms could experience success in learning. This model of learning differs significantly to traditional schooling as it emphasises children's potential as learners, teachers and active participants in their learning community. The use of technologies in informal learning settings is of considerable interest to educational research. It is commonly identified that children naturally access and use new technologies as part of their everyday lives [2] and therefore it is important to educators to find out how and what children learn through the informal use of digital technologies. Further, it is likely that we can learn from observing these interactions and use these ideas to help design new approaches to formal education

Keywords digital media; informal learning

1. Background

"Digital media" is a fairly new term that we use, perhaps in place of the term "multimedia". Whereas multimedia could be referred to as "pertaining to a computer mediated software program or document containing media such as text audio, video, animation and graphics" [3] "digital media" broadens this concept beyond the computer and instead focuses on the format of the media. "Digital media", therefore, refers to any content or presentation provided in a digital format. While a computer plays a role in production and presentation of the works of the Fifth Dimension, this role has lessened considerably since the days of multimedia production. Instead the children work more with digital devices such as still and video cameras for image recording and audio recording devices such as ipods. Further, we use the Apple laptops for compilation and review but the eventual product that we create is presented as a DVD so the children can play them at home in devices other than a computer.

The use of technologies such as digital media in informal learning settings is of considerable interest to educational research. It is commonly identified that children naturally access and use new technologies as part of their everyday lives [2] and therefore it is important to educators to find out how and what children learn through the informal use of digital technologies. Further, it is likely that we can learn from observing these interactions and use these ideas to help design new approaches to formal education.

Research in this area suggests that informal learning contexts have some distinct differences to formal settings. Sorensen, Danielsen, and Nielsen [4] suggested that the prominence of learning is inverted in an informal learning situation. In school, learning is the goal of the task – teachers design activities in order to engage children in learning outcomes. However in an informal learning setting, learning is simply a means to an end. Children learn skills and processes in order to reach their desired goal, whether it is

reaching a level in a computer game, chatting on line or building a web page. Further they identified the importance of social learning in "spare-time culture" (p. 3). This learning incorporated a number of learning forms. These were referred to by Sorensen et al [4] in dimensions of a) a learning hierarchy, where younger/older, confident/less-confident or experienced/less-experienced learners work in a apprenticeship model; b) the learning community in which social structures form and reform in a loose transition; and c) a learning network where knowledge is stored and accessed by consistent reference to each other.

2. Theoretical framework

The Fifth Dimension concept is based on the theoretical framework of Cultural-Historical Activity Theory (CHAT) [5]. The core concept of this theory is that awareness emerges from an individual participating in a social structure where activity incorporating the use of tools to produce artefacts leads to socially valued outcomes. In doing so, the individual develops their own perspective, changing the way they think and behave in future situations. The CHAT model was represented by Engestrom [6] in the form of a triangle where the subject interacts with the community, rules, division of labour, the instruments and the object (artefact) to reach the outcome. This triangle has now become a common framework for representing understanding based on this framework.

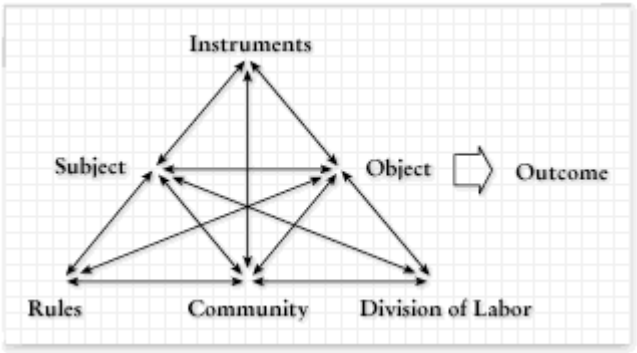

Fig 1: The CHAT Triangle (Engestrom, 1987)

The principle research methodology for this study is Case Study, however, as Cultural Historical Activity Theory not only provides a theoretical basis but also a guide to practice [1] the CHAT triangle is used for an analytical framework. In this context, the study considers the site as an activity system and maps the interactions between participants (children and adults), technology, pedagogy and environment. Understandings are drawn from field notes, structured and unstructured interviews, artefacts produced during activity and on-line materials such as email discussions within the Fifth Dimension community. The study has two main research foci:

- The informal learning patterns that emerge during production of products as a result of children gaining access to media and expert facilitation
- The benefits of providing pre-service teachers with the opportunity to engage in an authentic learning environment to investigate how children work and learn with digital media

4. 5D Australia

The current Fifth Dimension program in Australia began in 2005. The Fifth Dimension project site is located at a recently established regional centre of our university in a town approximately 40km north of the urban campus and is across the road from a primary school. The project was initially conducted in a pilot phase, with the initial participation group consisting of 12 children from Years 5 and 6, with ages

ranging between 9 and 12. The children attended after school for two and a half hours on one afternoon per week for eight weeks. In March 2006, the programme was implemented as an on going sustaining initiative and participation in the project was offered to pre-service teachers as part of the coursework of a unit on ICT curriculum integration. In this group, 25 children attended the programme from Years 5, 6 and 7 and three pre-service teachers chose to work in the project as an alternative assessment item for a unit relating to the curriculum integration of ICT. The program followed the same contact structure as the pilot over an eight week period. The third and current iteration is described in this paper.

The format of our Fifth Dimension programme is deliberately casual and very little structure is imposed. Direction in production is usually initiated in the first session by showing the students a variety of resources such as clay and pixilation animations. The children are told that there are roughly three genres for resource production: you can tell a story, in the form of a drama or a fantasy; you might give your audience a message, "don't waste water" or you can impart some information, this might be a documentary format, eg. This is what happens as a sunflower grows. The groups then brain-stormed and developed a story-board of what they might like to produce as a resource. As the Fifth Dimension researchers have always been either qualified teachers or training teachers, the impulse to shape this planning into something "educational" is strong, however, we are all very aware that this setting is "different" and the direction of the activity is largely decided by the children.

While at first impression, the Fifth Dimension project may seem to represent a laissez-faire method, this approach is actually a deliberate strategy to examine the choices children make when digital media tools and skills are available for their own purposes. The role of the research team is to facilitate access to high-tech equipment and software and facilitate the acquisition of skills in order to use these tools. Additionally we provide a support role, where we scaffold not only the technical aspects of the task but also the operational processes of the groups in terms of decision making social negotiation and the emotive aspects - reassuring when things get tricky and promoting celebration for those moments when it works and it is so exciting!

4. Promoting deep learning and engagement with digital media

The latest iteration of 5D Australia has provided some fascinating insights into how best to engage both children and student teachers in digital media production projects. The design of the program this time was influenced by two major issues arising from the previous two implementations. These were:

a) When children are first introduced to the 5D activity they are usually very excited and keen to get started on production. Due to this they are impatient when asked to plan and are often happy to follow the first ideas that come along with little attention paid to quality or creativity. Additionally it is possible that a particular group member might dominate discussions, persuading the group to follow one of their ideas without unpacking the concept for the other students in order to seek group clarity and consensus. In the first iteration this was especially evident with one group who seemed to constantly abandon their product idea, planning a new product each week until the final week when they had to quickly "do something."

b) The confidence and experience of the student researchers were over-estimated in the previous iteration. Although the helpers volunteered to participate as part of their course they really had little idea of what the project involved and what they needed to know. While the children were happy to "learn on the job", the student researchers were quite anxious that their skills were inadequate, especially as several of the children had already participated in one cycle of the program and knew quite a lot about the processes involved. Because of this, the students needed to seek the advice of the two project leaders frequently, requiring considerable assistance with technical skills, pedagogical strategies and even their own creative processes.

5D Australia/ cycle 3

Six students volunteered for the Fifth Dimension project this semester. Although their participation this time was interest based only and did not count towards assessment, these students will be given the opportunity to join the project again in semester 1, 2007 as part of their ICT curriculum unit.

The goals for the project this time were to:

- Extend the depth of the children's digital media production with particular attention on thoughtful planning and creativity.
- Provide more support for student researchers by scaffolding both technical and pedagogical processes

The design of this program was somewhat different to the last two iterations. The first new initiative was to provide a two hour workshop for the student researchers before work began with the children. This session provided the student researchers with a similar introductory experience to the children where they participated in a quick pixilation activity and then created a clay animation with plasticine. This was a good way to explain the project to them and it meant that they could draw on their own experiences with digital media when assisting the children.

The interaction with the children was also different this time around. Rather than working after school for one day a week for 7-8 weeks, we decided to have a shorter but more intense program. This time the program ran for only three weeks. During the first two weeks the children attended for 2 1/2 hours on one day per week as usual, however, in the third week we took advantage of a "pupil free" day when the children did not attend school because their teachers had professional development. On this day we held an intensive seven hour workshop which was followed by another after school session a few days later. This gave us a similar amount of time – 20 hours – but it certainly was a more intense experience.

Our first session with the children was designed as a "hook" to capture the children's imagination. After a brief introduction some of the children were recruited for a simple pixilation consisting of a group arrangement where children were added to the scene one at a time. The children were then shown the clay animation created by the student researchers and were asked to form groups to create their own animations. Three groups (two with five children and one with three) were created and two student researchers were aligned with each group. The children were given a few minutes to come up with a quick idea and then were given plasticine to create an animation. By the end of the session each group had produced a simple animated sequence. The children also got to see their pixilation sequence that had been compiled as they worked.

The first activity of the second session introduced the children to the concept of including sound in a digital media resource. In the previous iterations this process was typically left to the final stages and was often rushed with a focus on just finishing the resource rather than learning about the process. The addition of music and sound effects to the first animations allowed both the children and the student researchers to experiment and learn about incorporating sound. The second session also introduced a new initiative. In order to facilitate a shared understanding of their resource idea, each group was given a project planning book. This consisted of a large (A3) set of stapled pages incorporating a storyboard template, a section to list resources required and a blank timeline for the full day workshop. There were also a number of blank pages for the groups to record or plan as they required. The groups were told that they should use their book to record any decisions made on the project. The second activity of the second session was for the groups to go ahead and plan the development of their resource for the workshop. It was important that they were ready to begin construction as soon as possible when the workshop commenced.

The workshop began at a frantic pace and continued throughout the day as the groups created props, shot film sequences and assembled clay animation footage. Each group followed their own sequence throughout the day using their project planning book as a guide for what they would do in progression. The planning book worked extremely well, with group members and researchers consulting it consistently as the project progressed. By the end of the day all three groups had filmed all components of their digital media product. The day finished with everyone totally exhausted but satisfied with progress.

The last day was used to consolidate and finalise the product. After the workshop the project leaders reviewed the project planning books to ascertain where each group was up to. It was evident that resource finalisation depended on quite a few technical processes that the student researchers possibly hadn't encountered before, such as converting a Garage Band track to MP3 to insert into a movie. In order to facilitate these processes, the project leaders provided customised technical instructions for each group on a blank page in the project planning book. This meant that the purpose of the book was not only for the group to record their ideas but also as a communication device that supports interaction between all members of the learning community. This mechanism worked well and the groups used the time available in this session effectively to compile their images, add sound and render a final media product.

The final stage of a 5D Australia iteration is a DVD compilation of the resources created. The DVD is currently being created and the children, their parents and the student researchers will be invited to attend and after school presentation celebrating their achievements.

5. Conclusion

5D Australia is designed to be a sustainable research site that will support research that establishes closer links between schools and the University. It is anticipated that this project will provide informative data on the importance of informal learning and how it complements the more formal curriculum for both children and pre-service teachers

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